REMARKS

Claims 19-45 are pending in this application. Claims 19, 23-27, 38-40 and 43-45 have been changed by this amendment. Applicant reserves the right to introduce claims of original scope in a continuation or other related application. The claims have been amended to improve the form thereof, and not for reasons of patentability.

The Examiner rejected claims 19-45 under 35 U.S.C. §102(a) as being anticipated by Rosenberg et al. '613, or Rosenberg et al. '811. Applicant respectfully traverses. The present application is a continuation of App. No. 09/333,613, filed June 15, 1999, which is a continuation of App. No. 09/185,301, filed November 3, 1998, which is a continuation of App. No. 08/854,375, filed May 12, 1997, which is a continuation of App. No. 08/543,606, filed October 16, 1995, which is a continuation-in-part of Application No. 08/275,070, filed June 9, 1994, which is a divisional of App. No. 07/984,324, filed December 2, 1992. The specification has been amended as set forth above to make this chain of priority clear.

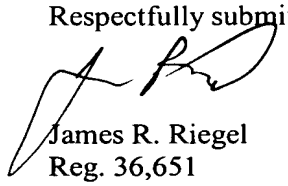
Rosenberg et al. '811 has a filing date of September 27, 1995 and Rosenberg et al. '613 has a filing date of November 13, 1996. However, pending claims 19-34 are supported by the parent patent applications filed as far back as December 2, 1992, and thus claim priority to December 2, 1992, which predates the filing dates and priority dates of Rosenberg et al. '811 and Rosenberg et al. '613. Rosenberg et al. '811 and Rosenberg et al. '613 therefore cannot be used in a 102 rejection against those claims.

Pending claims 35-45 can claim priority at least as far back as October 16, 1995. Even if these claims are not believed to gain earlier priority, Rosenberg et al. '811 and Rosenberg et al. '613 do not disclose or suggest outputting a maximum peak force from an actuator and reducing the output of the maximum peak force to a steady-state nominal peak force when power utilized by the actuator exceeds an average power level as claimed in claims 35 and 45. Applicant therefore believes claims 35-45 are patentable over Rosenberg et al. '811 and Rosenberg et al. '613. The claims dependent from claims 35 and 45 are patentable over Rosenberg '811 and '613 for additional reasons.

In view of the foregoing, Applicant believes that claims 19-45 are patentable over Rosenberg et al. '613 and Rosenberg et al. '811, and respectfully requests that the rejection under 102(a) be withdrawn.

In view of the foregoing, Applicant respectfully requests a Notice of Allowance from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,



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MARKED-UP VERSION OF AMENDMENTS

In the Specification:

Replace the paragraph starting on page 1, line 2, with:

This is a continuation of U.S. Patent Application No. 09/333,613, filed June 15, 1999, which is a continuation of Application No. 09/185,301, filed November 3, 1998, which is a continuation of Application No. 08/854,375, filed May 12, 1997, which is a continuation of Application No. 08/543,606, filed October 16, 1995, which is a continuation-in-part of U.S. patent application [Serial] No. 08/257,070, filed June 9, 1994, which is a divisional application of U.S. Application No. 07/984,324, filed December 2, 1992 [Patent No. 5,389,865, issued February 14, 1995].

In the Claims:

All pending claims are reproduced below.

Please cancel claims 1-18 without prejudice.

19. (amended) A computer mediated control system for use in a force feedback system, said force feedback system including at least one actuator and at least one position sensor, said control system comprising:

a memory storing at least one force feedback effect, said at least one force feedback effect providing forces to be output to a user of said force feedback system; and

a computer mediated controller coupled to said at least one actuator and to said at least one position sensor, wherein said computer mediated controller

receives input information through a communication port of said computer mediated controller and decodes commands from said input information,[;]

reads force values from said communication port,[;]

outputs output data on said communication port, said output data including position data from said at least one position sensor,[;]

determines at least one installed force feedback effect to contribute to output of said force feedback system, [;]

processes said stored force feedback effect to determine a force contribution from said force feedback effect, [;] and

outputs a force feedback value based on said determined force contribution to cause a force based on said force feedback value to be output by said actuator to the user of said force feedback system.

20. A computer mediated control system as recited in claim 19, wherein said force feedback effect is one of a detent effect, a wall effect, and a spring effect.

21. A computer mediated control system as recited in claim 19, wherein said force feedback effect includes at least one parameter, and wherein said at least one parameter is at least one of a stiffness parameter, a damping parameter, a force parameter, and a distance parameter.

22. A computer mediated control system as recited in claim 19, wherein said force feedback value is a result of summing force contributions from a plurality of installed force feedback effects.

23. (amended) A computer mediated [controller] control system as recited in claim 19, wherein pointers are provided by a user of said force feedback system to install desired force feedback effects to contribute to said output force feedback value.

24. (amended) A computer mediated [controller] control system as recited in claim 19, further comprising computing velocity from said position data received from said at least one position sensor and using said velocity in said determination of said force contribution.

25. (amended) A computer mediated [controller] control system as recited in claim 19, wherein said force feedback effect contributes to said output force feedback value as a result of a user manipulatable member being moved by a user to enter a boundary of said force feedback effect as determined by said position data.

26. (amended) A [method] computer mediated control system as recited in claim 25, wherein said output data includes button press data from at least one button provided on said user manipulatable member of said force feedback system.

27. (amended) A force feedback device, comprising:

a user manipulatable member having at least one degree of freedom of motion and being manipulatable by a user physically contacting said member;

at least one actuator outputting forces to said user;

at least one position sensor for determining a position of said user manipulatable member in said at least one degree of freedom; and

a computer mediated controller coupled to said actuator and to said at least one position sensor, wherein said controller

receives input information through a communication port of said computer mediated controller and decodes commands from said input information, [;]

reads force values from said communication port, [;]

outputs output data on said communication port, said output data including position data from said position sensor, [;]

determines at least one installed force feedback effect to contribute to output of said force feedback system, [;]

processes said installed force feedback effect to determine a force contribution from said installed force feedback effect, [;] and

outputs a force feedback value based on said determined force contribution to cause a force based on said force feedback value to be output by said actuator to the user of said force feedback system.

28. A force feedback device as recited in claim 27, wherein said user manipulatable member is a joystick.

29. A force feedback device as recited in claim 27, further comprising a deadman switch for disabling said output forces when said user is not manipulating said member.

30. A force feedback device as recited in claim 27, further comprising a gear transmission provided between said joystick and said plurality of actuators, said gear transmission transmitting said output forces from said actuators to said member.

31. A force feedback device as recited in claim 27, wherein a memory is accessible to said software controller.

32. A force feedback device as recited in claim 31, wherein said memory is non-volatile memory.

33. A force feedback device as recited in claim 27, wherein said force feedback effects include at least one of a detent, a wall, and a spring.

34. A force feedback device as recited in claim 27, wherein each of said force feedback effects includes at least one parameter, and wherein said at least one parameter is at least one of a stiffness parameter, a damping parameter, a force parameter, and a distance parameter.

35. A method for providing output force from an actuator in a force feedback device, the method comprising:

outputting a maximum peak force from an actuator on a user manipulatable object of said force feedback device, wherein a user can manipulate said user manipulatable object in a degree of freedom, and wherein said maximum peak force is related to a maximum power that said actuator can utilize instantaneously; and

reducing said output of said maximum peak force to an output of a nominal peak force from said actuator when said power utilized by said actuator exceeds an average power level over a predetermined period of time, wherein said nominal peak force is related to a maximum power that said actuator can utilize in continuous steady-state operation.

36. A method as recited in claim 35, wherein said maximum peak force is output only when said user initially moves said user manipulatable object into an object simulated by a computer system.

37. A method as recited in claim 35, wherein said maximum peak force has about twice as great a magnitude as said nominal peak force.

38. (amended) A method as recited in claim [36] 35, wherein said nominal peak force is associated with an average current during operation of said actuator.

39. (amended) A method as recited in claim [36] 35, further comprising monitoring average power requirements of said actuator over time to determine when said power utilized by said actuator exceeds said average power level over said predetermined period of time.

40. (amended) A method as recited in claim [36] 35, wherein said predetermined period of time is about two seconds.

41. A force feedback device that interfaces with a computer graphical simulation, said force feedback device comprising:

a user manipulatable object moveable by a user in at least one degree of freedom;

at least one sensor that detects a position or motion of said user manipulatable object in the at least one degree of freedom; and

at least one actuator outputting a force on the user manipulatable object, the at least one actuator outputting a maximum peak force on the user manipulatable object,

wherein the peak force is related to a maximum power that the at least one actuator can utilize instantaneously, and wherein the maximum peak force is reduced to a nominal peak force by the actuator when the power utilized by the actuator exceeds an average power level over a predetermined period of time, wherein the nominal peak force is related to a maximum power that the actuator can utilize in continuous steady-state operation.

42. A force feedback device as recited in claim 41, wherein the maximum peak force is output only when the user initially moves the user manipulatable object into an object simulated in the computer graphical simulation.

43. (amended) A [method] force feedback device as recited in claim 41, wherein the maximum peak force has about twice as great a magnitude as the nominal peak force.

44. (amended) A [method] force feedback device as recited in claim 41, wherein the predetermined period of time is about two seconds.

45. (amended) A [method] force feedback device as recited in claim 41, wherein the user manipulatable object is a joystick.